The conventional approach to research by students follows the sequence:

* Prerequisite requirement: personal skills
* Planning
* Gathering data (evidence)

i.e Conducting the research

* Processing data
* Drawing conclusions
* Evaluating the research

We usually ask students to follow these steps in reporting:

* Aim
* Hypothesis
* Method
* Results
* Conclusion
* (Discussion)

Research by students usually follows a sequence similar to that shown above.

The following tables demonstrate how some enquiry standards may be grouped to match these headings.

Notice that not all standards are accommodated in this scheme (see table on last page).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| METHODS OF SCIENTIFIC INVESTIGATION AND RESEARCH | | | | |
| Planning | | | | |
| Standards and aspects assessed | Below the standard | Approaching the standard | Meets the standard | Exceeds the standard |
| 1.1 Identification of a focused research question | | | | |
|  |  |  |  |  |
| 1.3 Identifying and controlling variables | | | | |
|  |  |  |  |  |
| 1.2 Make predictions directly related to a research question | | | | |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Obtaining and processing evidence | | | | |
| Standards and aspects assessed | Below the standard | Approaching the standard | Meets the standard | Exceeds the standard |
| 4.1 Select and use correctly and competently the appropriate equipment and materials for an investigation, with due regard for the safety of self and others | | | | |
|  |  |  |  |  |
| 3.1 Record raw data appropriately in a manner that allows easy interpretation | | | | |
|  |  |  |  |  |
| 3.2 Process raw data by the most appropriate means | | | | |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Conclusion and evaluation | | | | |
| Standards and aspects assessed | Below the standard | Approaching the standard | Meets the standard | Exceeds the standard |
| 3.3 Draw valid conclusions allowing for errors and uncertainties | | | | |
|  |  |  |  |  |
| 1.5 Identifying weaknesses and developing realistic strategies for improvement | | | | |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Research | | | | |
| Standards and aspects assessed | Below the standard | Approaching the standard | Meets the standard | Exceeds the standard |
| 3.4 Use an appropriate range of methods to communicate scientific information | | | | |
|  |  |  |  |  |
| 1.8 Identify and make critical use of secondary information | | | | |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Personal skills | | | | |
| Standards and aspects assessed | Below the standard | Approaching the standard | Meets the standard | Exceeds the standard |
| 1.4 Work constructively and adaptively with others as a team an a scientific investigation | | | | |
|  |  |  |  |  |
| 1.7 Work in an ethical manner with regard to living things in the environment | | | | |
|  |  |  |  |  |
| 1.6 Work in an ethical manner with regard to acknowledging data sources | | | | |
|  |  |  |  |  |

|  |  |  |
| --- | --- | --- |
| **SCIENTIFIC ENQUIRY – PRESCRIBED STANDARDS** | **METHODS OF SCIENTIFIC INVESTIGATION AND RESEARCH – ADAPTED STANDARDS** | **CATEGORY** |
| 1.1 Identify and develop a clearly focused research question | 1.1 Identification of a focused research question | **PLANNING** |
| 1.2 Make predictions directly related to a research question | 1.2 Make predictions directly related to a research question |
| 1.3 Identify and control variables | 1.3 Identifying and controlling variables |
| 1.4 Work constructively and adaptively with others as a team on a scientific investigation | 1.4 Work constructively and adaptively with others as a team an a scientific investigation | **PERSONAL SKILLS** |
| 1.5 Evaluate experimental design, identify weaknesses and develop realistic strategies for improvement | 1.5 Identifying weaknesses and developing realistic strategies for improvement | **CONCLUSION AND EVALUATION** |
| 1.6 Work in an ethical manner with regard to acknowledging data sources and authenticity of results | 1.6 Work in an ethical manner with regard to acknowledging data sources | **PERSONAL SKILLS** |
| 1.7 Work in an ethical manner with regard to living things and the environment | 1.7 Work in an ethical manner with regard to living things in the environment |
| 1.8 Identify, and make critical use of, secondary information | 1.8 Identify and make critical use of secondary information | **RESEARCH** |
| 2.1 Understand the historical developments of the major scientific ideas |  |  |
| 2.2 Know how scientists disseminate their ideas and results to encourage discussion and further development |  |  |
| 2.3 Know that science can bring great advantages to humanity but can also cause considerable damage to the environment |  |  |
| 3.1 Record raw data appropriately in a manner that allows easy interpretation | 3.1 Record raw data appropriately in a manner that allows easy interpretation | **OBTAINING AND PROCESSING EVIDENCE** |
| 3.2 Process raw data by the most appropriate means | 3.2 Process raw data by the most appropriate means |
| 3.3 Draw valid conclusions, allowing for errors and uncertainties | 3.3 Use an appropriate range of methods to communicate scientific information | **CONCLUSION AND EVALUATION** |
| 3.4 Use an appropriate range of methods to communicate scientific information | 3.4 Use an appropriate range of methods to communicate scientific information | **RESEARCH** |
| 4.1 Select and use correctly and competently the appropriate equipment and materials for an investigation, with due regard for the safety of self and others | 4.1 Select and use correctly and competently the appropriate equipment and materials for an investigation, with due regard for the safety of self and others | **OBTAINING AND PROCESSING EVIDENCE** |
| 4.2 Follow instructions accurately but be able to adapt to unforeseen circumstances |  |  |